DOCUMENT RESUME

ED 170 891 EA 011 651

TITLE A Study of School Calendars.
INSTITUTION New York State Education Dept., Albany. Div. of Research.
PUB DATE Dec 78
NOTE 40p.; For related documents, see EA 011 645-50; Exhibit A may reproduce poorly

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Disadvantaged Youth; Elementary Secondary Education; *Energy Conservation; Fuel Consumption; Learning Processes; School Buildings; *School Calendars; *School Schedules; Summer Schools; Year Round Schools
IDENTIFIERS *New York

ABSTRACT

This report summarizes the Study of School Calendars in New York State. The Division of Research of the New York State Education Department was charged to study the effects of alternative school calendars on (1) energy conservation, (2) learning and retention of learning by students, (3) maximum utilization of school facilities, and (4) changing family and societal living patterns. Findings from research suggested that closing of school buildings may save fuel for the district, but probably causes increased fuel use in the homes. Research pertaining to learning and retention of knowledge supports the educational value of shorter vacation spans. The literature also supports the term rotation calendar as an operational procedure to make maximum use of school buildings. Unfortunately, public acceptance of year-round schooling is weak. Recommendations are that the Board of Regents should (1) seek enabling legislation that would allow school districts to operate experimentally under a calendar not presently deemed permissible; (2) encourage school districts to establish their own conservation practices; and (3) encourage the expansion of summer school programs, especially for the lower socioeconomic and handicapped students who could most benefit. (Author/ML F)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

- ED170891

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

A STUDY OF SCHOOL CALENDARS

Conducted for the Board of Regents
of the
State of New York

by
The Division of Research

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

J. Miller

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Albany, New York 12234
December 1978

EA 011 651

THE UNIVERSITY OF THE STATE OF NEW YORK

Regents of The University (with years when terms expire)

1981	Theodore M. Black, A.B., Litt.D., LL.D., Pd.D., D.C.L., L.H.D. Chancellor	Sands Point
1988	Willard A. Genrich, LL.B., L.H.D., LL.D. Vice Chancellor	Buffalo
1986	Kenneth B. Clark, A.B., M.S., Ph.D., LL.D., L.H.D., D.Sc.	Hastings on Hudson
1983	Harold E. Newcomb, B.A.	Owego
1982	Emlyn I. Griffith, A.B., J.D.	Rome
1983	Mary Alice Kendall, B.S.	Rochester
1984	Jorge L. Batista, B.A., J.D., LL.D.	Bronx
1982	Louis E. Yavner, LL.B.	New York
1979	Laura Bradley Chodos, B.A., M.A.	Vischer Ferry
1980	Martin C. Barell, B.A., I.A., LL.B.	Kings Point
1981	Joseph R. Bongiorno, B.S., M.D.	Brooklyn
1984	Louise P. Matteoni, B.A., M.A., Ph.D.	Bayside
1981	J. Edward Meyer, B.A., LL.B.	Chappaqua
1985	Arlene B. Reed-Delaney, B.A., M.D.	Albany
1987	R. Carlos Carballada, B.S.	Arcade

President of The University and Commissioner of Education
Gordon M. Ambach

Executive Deputy Commissioner of Education
Joseph J. Blaney

Deputy Commissioner for Elementary, Secondary and Continuing Education
Robert R. Spillane

Director, Division of Research
Carl E. Wedekind

FOREWORD

This multi-faceted report is the culmination of more than a year's research conducted by the Division of Research of the New York State Education Department at the direction of the Board of Regents. Carl E. Wedekind, Director of the Division of Research, served as Project Director. Guidance and advice as to the general conduct of the study was provided by a Regents Advisory Task Force, a Technical Task Force and a State Education Department Steering Committee.

This pioneering study reflects the concern of the Board of Regents that the research include all aspects related to alternative school calendars. Because it is broad in scope, it can be a valuable resource when considering the effects changes in school calendars might have upon energy consumption, upon student learning, upon the use of school facilities and upon the sentiment of various sectors of society.

Gordon M. Ambach
President of The University and
Commissioner of Education

ACKNOWLEDGEMENTS

Many hundreds of people have been involved, either directly or indirectly in this study. Unfortunately, because the participants were so numerous, the names of most cannot be listed. Among those who must remain individually unsung are the students, parents, teachers, school administrators, and college staff; industrial, business and union leaders; representatives of police, recreation, social work and women and professional staff members of the New York State Education Department who responded to questionnaires or surveys. Also omitted are the names of students, parents, custodians and school administrators who supplied information about fuel use and clerks and school administrators who provided teacher attendance figures. Without the cooperation of the above individuals the study would have been shallow.

Some of those individuals more immediately involved in the Regents Calendar Study will be acknowledged later when various assisting committees are discussed. However, members of the Division of Research, who constituted the study staff, must be cited because of their major role in the conduct of the study. The following staff members were temporarily relieved of their regular duties to work full time on the Regents Calendar Study: William Alwell, Philip Pillsworth, and Gerald Wohlferd (Operations Manager). C. Stanton Baltzel and Robert Miller of the Division of School Facilities Planning, were especially helpful in the area of fuel consumption and conservation. Professional assistance was provided by non-Department consultants Lorne Woollatt, George Thomas, Fred Gitlitz and Jack Conway.

The assistance of Donald Gardner of the Albany-Schoharie-Schenectady BOCES and his staff is also gratefully acknowledged as are the efforts of clerks and typists who are basic to the successful completion of any project. The mutual cooperation and diligence of those involved in the study was most appreciated.

Carl E. Wedekind, Director
Division of Research

TABLE OF CONTENTS

	Page
Foreword	iii
Acknowledgements	iv
Summary and Conclusions	1
Recommendations	2
Introduction	3
Selection of Calendars	4
Research Studies	5
Findings from the Studies	8
Technical Exhibit A, Final School Calendars	15

A STUDY OF SCHOOL CALENDARS

SUMMARY AND CONCLUSIONS

Nine school calendars were designed to conserve energy, foster pupil learning, make maximum use of facilities or provide flexibility of scheduling. Energy savings were to be promoted through extended closing of schools during cold weather. Pupil learning was to be advanced through reduction of the length of vacation periods. Facilities were to be more fully utilized by increasing the number of pupils using the buildings. Flexibility was to be furthered by removing all vacations other than the legal holidays in order to allow individual scheduling when foul weather or other emergencies occurred. Fourteen research studies, ranging from collection of original data to literature searches, were conducted. Public acceptance of the calendars was polled along with opinions as to the advantages and disadvantages of each.

Findings from research suggested that closing of school buildings may save fuel for the school district, but probably causes increased fuel use in the homes. Thus, calendars designed to conserve energy would probably not be conducive to that end, and may be counterproductive. Should the closing of school make necessary the lengthening of the school year into the summer months, air conditioning costs, if any, would more than overbalance winter fuel savings. If no air conditioning is available, the school buildings would be quite uncomfortable, especially if school were in session all day. Therefore, calendars, designed only for closing schools in the winter, are of doubtful value.

Research pertaining to learning and retention of knowledge supports the educational value of shorter vacation spans. Unfortunately, public acceptance of year-round schooling is weak. However, since lower socioeconomic children, particularly those in the big cities, might benefit most from summer school, an expansion of summer learning opportunities for them might be publicly acceptable.

The literature supports the Term Rotation Calendar as an operational procedure to make maximum use of school buildings. Even though this calendar also promotes better achievement, the year-round feature makes it unattractive to many people. Nonetheless, interest in this calendar has been shown by several school administrators.

The Tentatively Scheduled Calendar was designed primarily to foster learning, but it also allows the flexibility of not scheduling vacation days (approximately 15) until the school year has neared completion. Though the concept is practical and is in use in other states and countries, its popularity among children, adults, and school personnel in New York State is weak.

It would seem there is no calendar universally preferred by all factions of society, nor any universally rejected. The Traditional Calendar, however, is most acceptable, while the Four Stream, Term Rotation Calendar is least acceptable.

RECOMMENDATIONS

Since none of the alternative school calendars under study appears to be superior in all aspects — energy conservation, fostering learning, social acceptance, and maximization of use of facilities — it would seem unnecessary for the Board of Regents to change the method by which individual school calendars are presently selected. Instead, the Board of Regents should seek enabling legislation which would allow school districts to operate experimentally, at the discretion of and with the approval of the Commissioner of Education, under a calendar not presently deemed permissible.

Further, since many districts have been able to drastically reduce their energy expenditures through judicious application of energy conservation procedures, the Board of Regents should encourage those districts not yet employing such conservation measures to establish their own conservation practices. In this matter, full support and recognition of the efforts of the Division of School Facilities Planning should be tendered.

In addition, the Board of Regents should encourage the expansion of summer school programs, especially for the lower socioeconomic and handicapped students who could most benefit.

A STUDY OF SCHOOL CALENDARS

INTRODUCTION

In February of 1977, during the winter fuel shortage, Governor Hugh Carey ordered industries and schools in New York State to close in order to assure an adequate supply of energy for consumption in homes. At that time doubts were expressed that closing of schools would in fact conserve energy. It was maintained by some individuals that heat produced by light bulbs and the bodies of students and teachers makes up a large proportion of the heat necessary to raise the temperature from the closed down level (about 55°F) to the opened or operating level (about 70°F). Others suspected that any energy savings gained through a school shut-down would be counterbalanced by equal or greater use of energy in the homes.

Subsequently during a discussion of present and future energy supplies for the nation and for local school districts, the Board of Regents of the State of New York suggested the school calendar could be altered to provide a long winter vacation. Analysis of responses to the suggestion found the public to be opposed to an extended winter closing. Believing that insufficient evidence was available upon which to base a decision, the Regents in April 1977 directed the Division of Research of the New York State Education Department to conduct a study of the implications of operating schools under a calendar having a winter closing. Also to be included in the study were other types of school calendars not specifically designed to foster conservation of energy. The other calendars designed for educational and financial ends were included to complement the study of school calendars.

Study Staff

Three Division of Research staff members were assigned full time to the study under the general direction of Carl Wedekind, Director of the Division. Professionals of other State Education Department units were directed to provide support upon demand.

Supportive Staff

The Board of Regents established three groups to assist the Division of Research: 1) a Steering Committee of State Education Department staff which consisted of William Haessig, Director, Division of School Facilities Planning; James Moore, Director, Division of School Health and Pupil Personnel Services; Gordon Van Hooft, Acting Assistant Commissioner, Office of Instructional Services; and John Bardin, Supervisor, Bureau of Elementary School Supervision; 2) an Advisory Task Force composed of Shirley Anderson, Public Service Commission; William Davis, New York State Energy Office; Peter DelGiorno, Conference of Large City Boards of Education; Jean DePesa, United Parents Association; Barbara Diebold, New York Educators Association; Parker Dodge, New York State School Boards Association; David Fish, New York State Council of School District Administrators; Edwin Fox, School Administrators Association of New York State; Stephen Hinrichs, New York State Association of Independent Schools; Mrs. Leon Polin, New York State Congress of Parents and Teachers; and Charles Santelli, New York State United Teachers; and 3) a Technical Task Force including Patrick Anderson, Carrier Corporation; Peter Ansell, New York State Department of Commerce; Edward Diamond, The Civil Service Employees Association; Brother Thomas Draney, Catholic School

Administrators; Msgr. James Feeney, Archdiocese of New York; Norman Harrington, Niagara Mohawk Power Corporation; Charles Hughes, American Federation of State, County and Municipal Employees; Donald Larson, New York Council of Mayors; Peter McManus, North Colonie Central School; May O'Hagan, National Association of Social Workers; Inge Parlo, Independent Student Coalition; Gordon Purrington, State University of New York at Albany; Tallien Robinson, Department of Labor; Max Rosselot, State University of New York at Stony Brook; Robert Svoboda, New York State Attendance Teachers Association; and Max Yeater, Rensselaer Polytechnic Institute.

The Charge

The Division of Research was charged to study the effects of alternative school calendars upon: 1) energy conservation, 2) learning and retention of learning by students, 3) maximum utilization of school facilities; and 4) changing family and societal living patterns.

SELECTION OF CALENDARS

Numerous school calendars were reviewed by the calendar project staff. Those chosen for more serious consideration met the tests of being sensible, providing at least 180 days or an hourly equivalent during which school would be in session, and representing different concepts. Nine preliminary calendars were selected for more serious consideration. At the advice of the Steering Committee, and as a result of responses received during a field testing of survey instruments, the final set of calendars to be considered (Exhibit A) was established when a new calendar was added to replace one of those under consideration.

Calendars Designed for Energy Conservation

Two calendars were designed to save energy by closing schools during cold periods. Their design was based upon the assumption that less heat and light are used when schools are closed than when in session during cold months, since thermostats are turned down and lights left off. One of the calendars closed schools the last week of January and the first two weeks of February, plus a week at the end of December. No Spring vacation was allowed and school was in session through the end of June.

The second calendar closed school the last three weeks of February, while allowing two weeks of vacation around Christmas/New Year's Day and a week in April. In order to balance the number of days of the first half of school before Christmas and the second half after the beginning of the year, school opened in the third week of August, but closed after the second week in June.

Three calendars were developed which shortened the school week either during the whole school year or only during the winter months. One calendar with a four-day week kept the same number of hours, ($5\frac{1}{2}$) per day, as the traditional calendar. Time lost from the extra day on the weekend (Mondays or Fridays) was scheduled to be made up by holding school for either the month of July or August.

Another of the four-day calendars increased the number of hours per day to 7½ hours. Because of the added time each day designed into this calendar, school did not need to be in session during the summer to match the hours of the traditional calendar.

A third four-day calendar was constructed to conserve energy by holding school four days per week during the colder months and reverting to five days per week during the warmer months. The four-day/week months were November through March. Daily sessions were scheduled at 6 hours per day to yield the same number of classroom hours as contained in the traditional calendar. School was to be in session from the first of September through the end of June.

Calendars Designed to Foster Learning

Two year-round calendars were felt to have the potential to foster better learning since forgetting was less likely to occur over the shorter 3-5 week vacations provided in each, than during the summer vacation of ten weeks. The four-day, 5½ instructional hour day calendar also was felt to encourage continuation of learning because of its short four-week summer vacation.

A school calendar was included which allowed flexibility of scheduling of vacations. Under this calendar, vacations were not to be fixed until after the likelihood of foul weather emergencies or other closings had passed. Thus, vacations, other than mandated legal holidays, would generally be taken in the Spring. This calendar would tend to assure that children would receive the benefits of a full 180 days of schooling, in spite of weather conditions.

Calendar Designed for Maximum Use of Facilities

Maximal use of facilities was considered by inclusion of a year-round school calendar which provided for the rotation of groups of students throughout the year so that one-fourth of the students were always on vacation. The capacity of a school building could be increased by 20% by such cycling. Also, since school was to be in session year-round, the school would not sit idle for the customary ten weeks.

The Traditional Calendar

Of course, the traditional school calendar was also included in the study for purposes of comparison.

RESEARCH STUDIES

The suggestions and recommendations of members of the Steering Committee and the Advisory Task Force pertaining to calendars and to research projects were solicited through a series of four meetings, and in special situations by telephone.

Several studies were conducted by, or under the direction of, Division of Research staff to test the assumptions undergirding the alternative school calendars and to determine acceptance of each calendar by various sectors of society.

Energy Studies

Energy—its use, conservation, cost and supply—has not been of major importance to educators in the past. Fuels have been relatively cheap and abundant. Suddenly, energy, or the lack of it, has come to the forefront. Yet many individuals do not believe there is an incipient fuel shortage. Should there be no real threat of a shortage of energy, any change of school calendar to conserve energy would be capricious at best. To determine the facts about energy a literature search was conducted. The search covered such aspects as energy demands versus energy supplies, development of alternative sources of energy, projected supplies, effect upon school budgets, and need for conservation measures.

Another study was conducted to determine whether or not schools should be closed during cold weather. Actual energy consumption data were supplied by custodial staff of 24 school buildings during the month of February 1978. The ten school districts, of which the school buildings were a part, were spread across the state in order to assure representation in the various temperature zones. Seven districts also secured the cooperation of students who provided energy use data of their homes. This study provided clues as to the amount of energy used in schools and in homes when schools were in session and closed.

A simulation of energy consumption by schools as though operated under each of the calendars was also executed. The basic data on which the computer predictions were based had been collected over several years. Cost of operation under each of the school calendars was also considered.

Finally, separate studies, articles, memos and newspaper clippings which dealt with energy conservation practices in schools were collected and summarized.

Studies Dealing with Fostering Learning

Four major studies were related to fostering learning. A literature search was conducted concerning learning, retention of knowledge, and forgetting. Included in the search were articles, books and research studies dealing with learning theory, means of fostering learning, methods of prolonging memory, speed of forgetting, and impediments to learning and retention of knowledge.

Under the assumption that children learn best by being in school, student attendance figures were studied to determine periods of low and high attendance. The pupil attendance patterns were analyzed for relationships with calendar type or climate severity.

Teacher attendance patterns were also studied since the consistent presentation of knowledge to students can be slowed or halted under the tutelage of a substitute teacher who does not know either the students or the level of learning of each student. Relationships of teacher attendance with school calendar types and weather were sought.

Many of the school calendars allowed time for summer school programs even though such programs were not built-in or specified as a part of the calendars. Summer school has been primarily used by students as a time for review and makeup. Few children avail themselves of the opportunity to take advanced courses or branch out into new fields. In an effort to determine how summer learning experiences can be financially supported, a study was conducted of the sources, uses, and restrictions of funds available for that purpose.

Finally, surveys were conducted which secured the opinions of individuals about the educational values of concepts; such as year-round school, shorter vacations, or longer school days; which are inherent in some of the calendars. Those questioned included pupils, parents, teachers, administrators, school board presidents, and professional staff members of the New York State Education Department.

A Study Dealing with Making Maximum Use of Facilities

It is common knowledge that school enrollments have been declining over the past few years. Educators have in the past shown great flexibility and ingenuity in handling increases and decreases in student numbers. Yet, in order to plan for maximum use of school facilities, some knowledge of future enrollment, in total and by subject area, is helpful. Consequently, enrollment projections were undertaken as a means of determining future space needs.

Research Concerned with the Effect of Alternative Calendars upon Society

Any school calendar change could affect society. The first individuals to be affected might logically be assumed to be those closest to the educational system, such as pupils and school staff. Of course any calendar change which would affect children would necessarily affect the parents of the children. Hence, a survey was conducted of students, parents, teachers, principals, chief school officers and school board presidents to elicit their opinions about the effects which the calendars would have upon learning, teaching, energy use, out-of-school experiences, and other areas of special concern to the respondents.

Colleges and universities might also be affected by a change of school calendar. Teacher training institutions might be judged the most likely to be troubled since practice teaching and observation schedules among colleges and local elementary and secondary schools may not coincide. Accordingly, coordinators of teacher training programs were contacted to ascertain their opinions of the possible resulting effects of the various calendar options upon their programs.

A change of school calendar might also cause problems to other than educational sectors of society, especially those calendars radically altering vacation periods. Representatives of business groups, labor unions, industrial associations, women's rights organizations, social agencies, and resort industries were asked to respond to a questionnaire in which they ranked their calendar preferences and the strength of their feeling about each.

The project office also made note of unsolicited letters, newspaper items, documents and reports which dealt with the effect of the calendars upon society. These were gathered, compiled and analyzed and were included as a separate study.

There were, then, fourteen studies conducted by the Division of Research which touched in some manner upon the four areas included in the charge from the Board of Regents: learning and retention of learning, energy conservation, maximum use of facilities and effect upon changing family and societal living patterns. Copies of the individual studies totaling about 400 pages have been published as technical reports and exhibits in limited number, and can be obtained upon request.

FINDINGS FROM THE STUDIES

Eight school calendars were designed to either conserve energy, encourage learning and retention of knowledge by students, make maximum the use of facilities, or provide combinations of the above. A ninth calendar, the traditional format, was included for comparison purposes. Since the calendars sometimes incorporate more than one concept, the findings of the research studies will be first discussed under three of the purposes as established by the Board of Regents. Advantages and disadvantages which are unique to any single calendar, as revealed by the research studies, will be next presented. Finally, the acceptability of the calendars by various sectors of society will be discussed.

Research Findings Pertaining to Energy Conservation

Is there a need to conserve energy, or is there much ado about nothing? The recent gasoline and natural gas shortages would support the first opinion, while the slow pace at which our Federal government is moving on energy regulations would support the latter. If indeed there is no need to conserve energy, then the school calendar need not be changed for that reason. However, evidence gathered in the literature search supports the need for energy conservation (Energy Sources, Costs, and Availability, Technical Report #1). At the present and projected rates of energy consumption, oil and gas production will no longer meet our demand for energy somewhere near the year 2000. The problem is essentially one of increasing demand and decreasing production. Fossil fuel fields which are easy to find and to develop have already been exploited. The capacity of each is finite and as reserves in a field approach depletion, the removal of that remaining becomes more difficult and costly. The discovery and development of new fields becomes less frequent, more difficult, and more expensive. Thus, while fossil fuel sources may for a time, through the discovery of new fields, keep up with demand, such will not always be the case. Cost may also be expected to rise each year.

Our country demands a major share of the world's energy resources. As more and more countries are reaching our level of development, they demand an increasing proportion. Increasing world demand will hasten the day when resources are depleted and will, of course, contribute to ever rising costs.

Though coal seems to present an attractive escape from our dilemma, many problems have to be surmounted before that resource reaches its promise. Among the problems involved with use of coal are its production, transportation and use. Ecological restraints are inherent in all three. Removal of coal without damaging the landscape, flora, and fauna will cause a rise in production costs. Reestablishment of rail lines and distribution points can be expected to draw criticism. Use will necessitate either changeover or construction of new facilities. In either of these cases proper pollution clean-up is a costly burden. The shift to coal will, therefore, take time and cause energy derived from coal to cost more than at present.

Development of other types of energy is sometimes not possible or will take several years. For example, a large increase in the production of electricity by water power is unlikely since most of the sites for large dams are already exploited. Wind power is an erratic source and at present the storage of electricity produced presents problems. Solar production of energy is still in the developmental stage and is not expected to become an important source of energy for several decades. Geothermal and tidal production of energy is limited as to production sites. The above alternative methods of energy production are not expected to fill the gap caused by decreasing oil and gas resources in time to avert a major fuel crisis unless immediate and massive measures are undertaken. The need for energy conservation is documented and the educational sector must do its part.

Closing of school buildings during cold winter months may be counter-productive to total saving of energy. Energy needed for heat, light, and other school operations was found to be somewhat less when schools were closed. This was revealed in the study conducted by Educational Facilities Laboratories, Inc. as well as our own study. Energy consumption, as measured in the homes of children, was somewhat more when schools were closed. Thus, it would seem that closing of schools causes an increase in the use of fuels and electricity in the homes. The data were expanded to represent all buildings and all homes in the sample district. The crude estimate of fuel consumption suggested that more fuel was used in the homes than was saved by closing the buildings. The number of school buildings, which constituted the sample, was too small to allow a firm judgement of the actual situation. The number of homes in which data were collected was sufficiently large to place credence on the results, but the sample was not random. Thus, this evidence cannot be considered conclusive. However, it casts doubt upon the wisdom of closing schools in the winter to conserve energy. Calendars designed for the purpose of saving fuel — the special closing at mid-year, the mid-August start, and the three four-day-week calendars — may not accomplish their goal (Energy Consumption in Schools and Homes, Technical Report #2).

The above conclusion is especially true if closing of school in the winter forces operation in the summer. Few New York State schools have air conditioning other than in administrative offices. Summer operation may require the capital expense of installing air conditioning, plus the operational expense, thereafter. Operation of air conditioners has been shown to be quite expensive (School Calendars and Energy Use, Technical Report #3 and Energy Saving Practices in Schools, Technical Report #4).

The natural conclusion to be drawn from the above evidence is that closing of school in the winter in favor of operation during the summer is not a practical energy conservation measure.

Research Findings Pertaining to Learning and Retention of Learning

Learning, retention, and forgetting are quite obviously tied closely together. That which has not been learned cannot be retained in memory, nor can it be forgotten. Too, degree of mastery of a unit of knowledge is related to the amount of knowledge retained (Learning, Retention and Forgetting, Technical Report #5). How learning takes place is still under study. Neural circuits and their components are still being identified, as are chemical and electrical inducers and inhibitors. Where knowledge is stored and how it is retrieved is an ever unfolding mystery. The limits to memory are still theoretical.

However, even though the functions of the brain and its supportive input systems are not completely understood, there are hints to external forces which affect learning and retention of knowledge. For example, as suggested above, overlearning (complete mastery) results in longer retention, as does frequent review. Motivation to learn, the practicality of the knowledge units, and intelligence of the student, all affect learning.

Forgetting is common to all of us, and may be related to the method by which stimuli are received. Memory of smells may be the most durable, while touch and visual memories are of very short duration. Also, silent study is poorer than vocalization in learning.

Forgetting occurs most rapidly during the first twenty-four hours and then tapers off at a much slower rate. Review of materials reduces forgetting. Long summer vacations are especially damaging to pupils from low socioeconomic backgrounds, if there are no special efforts made to keep school-based knowledge alive. Summer programs and year-round schools are helpful in keeping low socioeconomic pupils progressing in academic achievement. Thus, calendars, whose design has the effect of reducing the span of vacations, are beneficial for an important segment of the student body. Pupils from average and above average socioeconomic backgrounds do not seem to experience drastic losses in learning over the summer months.

Pupils who are absent from school suffer in two ways; they drop behind the other children, and some forgetting takes place. Thus, if a school calendar avoided periods when large numbers of students were absent, pupil achievement might be enhanced. Analysis of pupil attendance data showed pupil attendance to decrease through February and then increase through June. About ten percent of the pupils were absent on a statewide basis in February. Though the percentage is not large, the number approaches 340,000 pupils. Calendars with January and February closings contain vacations which occur during periods of lowest attendance. There is no assurance that pupil achievement would be positively affected by the winter closing, nor is there any data which suggest the effect such a closing would have upon previous and subsequent attendance. Yet, it is possible that a mid-winter vacation which would save fuel dollars for the schools might also benefit the children by omitting the period when absences are highest (Student Attendance Patterns, Technical Report #6).

Teacher attendance patterns do not parallel those of pupils. Though the percentage of absences increases during the first few months, attendance fluctuates gently through the rest of the year. Hence, there would seem to be little chance of increasing teacher attendance by changing the school calendar (Teacher Attendance Patterns, Technical Report #7).

Opportunity for summer study is provided by many school districts on a limited basis. Generally, courses offered are those aimed at aiding pupils to pass the Regents Examinations. Tradition may be the most important restraint to larger summer offerings. Lack of financial support is also crucial. Though funds from all sources may be used for summer school, State aid is paid from September through June, causing a lack of dollars during the summer months. The State does support summer school by allowing 12% of the summer enrollment to be added to regular attendance figures, upon which State aid is calculated. Since State aid is calculated upon the previous year's attendance figure, it is always a year behind. Funds for any increase in program

must come from holdover funds, which the State restricts. Because of the above constraints, there is little likelihood that summer offerings will be expanded (Funds Available for Summer Instruction, Technical Report #8).

Research Findings Related to Making Maximum Use of Facilities

Enrollment projections assist chief school officers and boards of education to plan for the number of teachers, buses and classrooms that will be needed for the near and more distant future. A steady drop in school enrollments has been evident for several years. Reductions in elementary enrollment, felt a decade ago, have now reached the high school. The downward trend may be expected to continue for the next five years according to present birth records.

Combining with a decline in birthrate is an outmigration of people from New York State. Though the State has not yet reached zero population growth, the losses due to outmigration have resulted in an overall decline in the population of New York State.

Not only is overall enrollment decreasing, a shift from private and parochial enrollment to public schools has also taken place. This latter shift may be expected to cease somewhere in the neighborhood of 1990.

Allied with total enrollment projections are enrollment data by subject areas. These figures are important to school administrators in planning for classroom facilities and educational materials. A shift in popularity to trade and vocational subjects from the arts and sciences has taken place. Thus, Boards of Cooperative Educational Services (BOCES) are feeling the demand for more vocationally oriented courses, as are community colleges. Four-year colleges may find it necessary to enter the vocational areas, or at least provide extensions of vocational subjects, if they wish to maintain their enrollments (Enrollment Projections, Technical Report #9).

One school calendar which could help make maximum use of facilities is the year-round calendar with term rotation or cycling. This calendar allows up to 20% more students to use a school building at full capacity. Cycling has been used by some districts in the past to defer construction of new buildings when enrollments increased. There are still a few suburban districts with increasing enrollments in New York State that could profit from such a calendar (Supplemental Responses and Data About School Calendar Concepts, Technical Report #14). However, the cycling plan can be used in situations where decreasing enrollments are experienced in order to allow the closing of a building by consolidating enrollments into a single or other buildings, sooner than normal decreases would allow.

Advantages and Disadvantages of Calendars

The previous discussions have dealt with research studies of broad concepts which were incorporated into the various alternative school calendars. Several of the calendars have incorporated into their designs advantages and disadvantages which were not studied, or brought out in the discussions of the findings. Citations of pros and cons arose mostly from the more open-ended surveys, such as: Survey of Noneducational Sectors of Society, Technical Report #11; and Opinions of State Education Department Professionals, Technical Report #13. Other opinions were received through newspaper clippings, magazine articles and unsolicited letters. These were included in Supplemental Responses and Data About School Calendar Concepts, Technical Report #14. Advantages and disadvantages of the calendars which have not been previously mentioned will follow.

The Traditional School Calendar has the weight of tradition behind it. Family vacations, work schedules, even basic textbooks are designed around the school year of approximately 180 days of school with the summer vacation of about ten weeks. The summer break of the traditional calendar provides time for teachers to obtain further educational background, as do the other calendars with long summer vacations.

The Special Closing at Mid-Year Calendar reduces danger to students while traveling to and from school because the closing occurs during the shorter days and during hazardous and severe weather. Transportation costs would be reduced because bus operating costs are greater in cold weather. Too, major maintenance could be accomplished during the closing without conflict with the education of children. Because this calendar falls within the period September through June no changes in Education Law or Commissioners Regulations would be needed. The break could affect the continuity of learning, especially for the disadvantaged children. Sport schedules would be disrupted and physical conditioning of players would deteriorate. And finally, the long unbroken period of school following the hiatus could be too much for teachers and students alike.

Many of the strengths and shortcomings of the Mid-August Start Calendar are the same as those mentioned for the Special Closing at Mid-Year Calendar because of the longer mid-winter break included in both. However, the Mid-August Start Calendar has the added feature of equal semesters. The balanced semesters were seen to be an advantage for curriculum planning. Also, the early start would allow all pupils an earlier and longer education. Holding school in August was felt to interfere with summer camps and vacations, and to be too hot for children and teachers. Too, it would require law and regulation changes before the calendar could be implemented.

The Tentatively Scheduled Calendar could cause problems in scheduling of academic, sports, and field trips. Coordination with BOCES programs was predicted to be more difficult.

A Four-Day Week with 5½ Instructional Hour Day Calendar, because of attendance in either July or August, might cause problems in equating school test results with the published norms of nationally produced tests. The month of summer attendance would make graduate work for teachers difficult to obtain. Kitchens may be unbearably hot for the cooking staff. Laws and/or regulations would have to be changed to allow operation under this calendar. Low socioeconomic pupils may suffer nutritional loss due to an extra day per week when they cannot obtain a hot lunch. However, the added summer month will allow outdoor educational programs not possible under the current calendar. It would also allow the possibility of scheduling more inservice training days without interfering with regular school days, and has the added possibility of reducing the number of "snow" days.

As with the 5½ Hour Day Calendar above, the extra nonschool day included in the Four-Day Week with 7½ Hour Day Calendar could be used for inservice training. It would also increase the unsupervised time of pupils during the extra weekday. Closing of buildings would have to take place later in the evening, possibly causing labor contract problems; and practice for sports would have to take place after the evening meal. Children would have to travel in the dark more than under the traditional school day, due to the longer school day, which may be too long for emotionally and physically handicapped children, and for children from rural areas who, with bus travel time, might be away from home for nine hours or more. On the plus side, this calendar was felt to encourage modular scheduling, and would probably cut transportation costs.

The Four/Five-Day Week Calendar tends to reduce some of the problems inherent in the other four-day calendars by decreasing the number of four-day weeks. It also spans the same months as does the Traditional Calendar. Therefore, it inherits the advantages and disadvantages of the longer summer vacation, while gaining some of the positive (and negative) aspects of the four-day week. The lack of regularit of the calendar is seen as its greatest detraction, while the mid-winter closing is seen as a possible plus factor. Legal restraints would have to be removed to operate schools under this calendar.

The Continuous Learning Year Calendar would contain all the pluses and minuses contained in any of the calendars extending into the summer months. This calendar was felt to be beneficial to migrant children, especially the June/July segment. The aspect of continuity was seen as a strong point for disadvantaged and handicapped students. The uniform blocks of inschool time were seen as promoting mini-courses. Summer employment opportunities would be adversely affected, as would farming activities. Teacher contracts would probably need to be renegotiated, laws and regulations changed, and financial support schedules revised in order for schools to operate under this calendar. Articulation with calendars of other states would be difficult.

The Four Stream Calendar incorporates most of the advantages and disadvantages noted for the Continuous Learning Year Calendar, since it, too, is a continuous calendar. The short inschool sessions of this calendar and its frequent vacations were felt to be conducive to high teacher morale. Because of overlapping cycles, grade levels might ultimately be elimin[illegible], and a better, more closely coordinated curriculum might be developed. Also, staggered graduations could make it easier for a senior to find a job, since only a quarter of the seniors would be graduating at any time. Of course examinations of all sorts would have to be prepared and administered more often. Fielding a team or staging a musical or drama production could be more difficult under the Four Stream Calendar.

Findings Relative to Preferences for Calendars

Several studies were conducted to elicit the preferences of various sectors of society for the calendars under study. Among the studies were: Survey of Students, Parents, and School Personnel, Technical Report #10, Survey of Noneducational Sectors of Society, Technical Report #11; and Effects of Calendar Options on Teacher Training Institutions, Technical Report #12. Unsolicited opinions, and preferences expressed in letters, newspaper clippings, and magazine articles are included in Supplemental Responses and Data About School Calendar Concepts, Technical Report #14.

The Traditional Calendar was the favorite of nearly all sectors of society. The year round calendars were most often rejected. Infringement upon summer vacation was the dominant reason for preferring or rejecting a calendar. Yet, industry would accept the Four-Day Week with 7½ Hours per day Calendar, while unions ranked that calendar sixth. The resort organizations felt the calendars which shortened or eliminated summer vacation to be especially ruinous. Teachers saw value in the lengthened day and lengthened school year calendars as conducive to learning, while still preferring the Traditional Calendar. High school students would accept a lengthened school day in conjunction with a shortened week. Administrators of teacher training programs felt their institutions could adapt to any calendar. Thus, it would seem that none of the calendars were found to be completely unacceptable to

all groups, though the Four Stream Calendar was most strongly opposed. In contrast, the Traditional Calendar was most acceptable to the majority. In spite of personal preferences there is interest, more especially on the part of school administrators, in greater flexibility in the choosing of calendar types.

EXHIBIT A

Final School Calendars

for

A Study of School Calendars
Conducted for the Board of Regents
of the State of New York

by

The Division of Research

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Albany, New York 12234

ALTERNATIVE SCHOOL CALENDARS

The nine calendar options being studied are described in this document. The options are representative and may be changed if needed. The important characteristics of each study calendar option are listed below.

Calendar Option

1. Traditional. The existing school calendar with 180 days, September through June.

2. Special Closing in Mid-Year. The existing school calendar with a three-week closing in January and February; no spring vacation.

3. Mid-August Start. A mid-August opening of school with a two-week vacation in December and January, and a three-week vacation in February. The school year breaks into two equal semesters before and after Christmas vacation.

4. Tentatively scheduled calendar. The calendar has 200 flexibly scheduled instructional days; only 180 need be used. Twenty "built-in-closing days" are used for any winter contingencies and/or tentatively scheduled spring vacations.

5. Four-Day Week, 5½ Instructional Hour Day. School is in session four days each week for 11 months, September through July, though summer vacation can be either in July or August. The calendar has 183 school days.

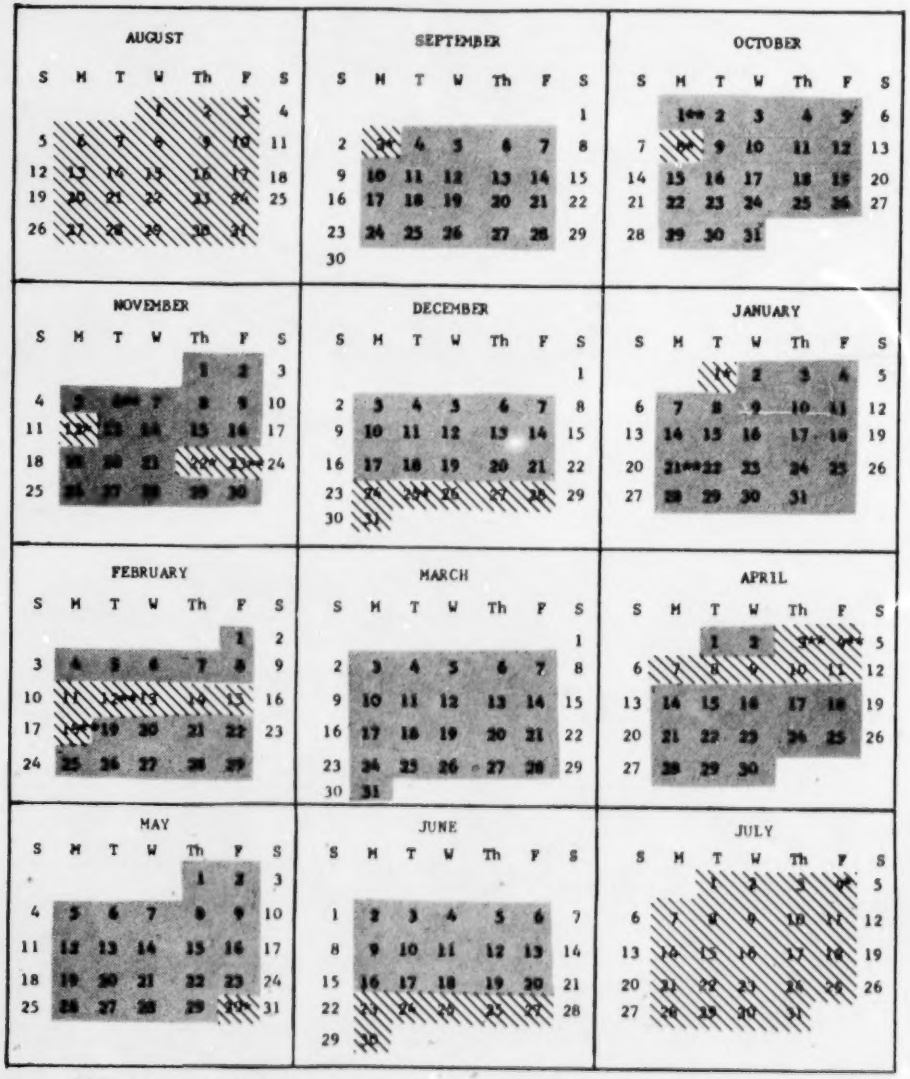
6. Four-Day Week, 7½ Instructional Hour Day. School is in session four days a week for 10 months, September through June. The calendar has 136 school days.

7. Four/Five Day Week. School is in session five days a week in September, October, April, May, and June, and in session four days a week in November through March. Each day has six instructional hours. The calendar has 168 school days.

8. Continuous Learning Year. A continuous learning year with five instructional time blocks of eight weeks with approximately two weeks vacation between each.

9. Four Stream. A four stream, year-round school calendar. Children in a school district are divided into four groups. Three of the groups are in school while a fourth group is on vacation. Students attend school for 45 days and then are on vacation for 15 days. All groups are on vacation for two weeks at Christmas and other common holidays.

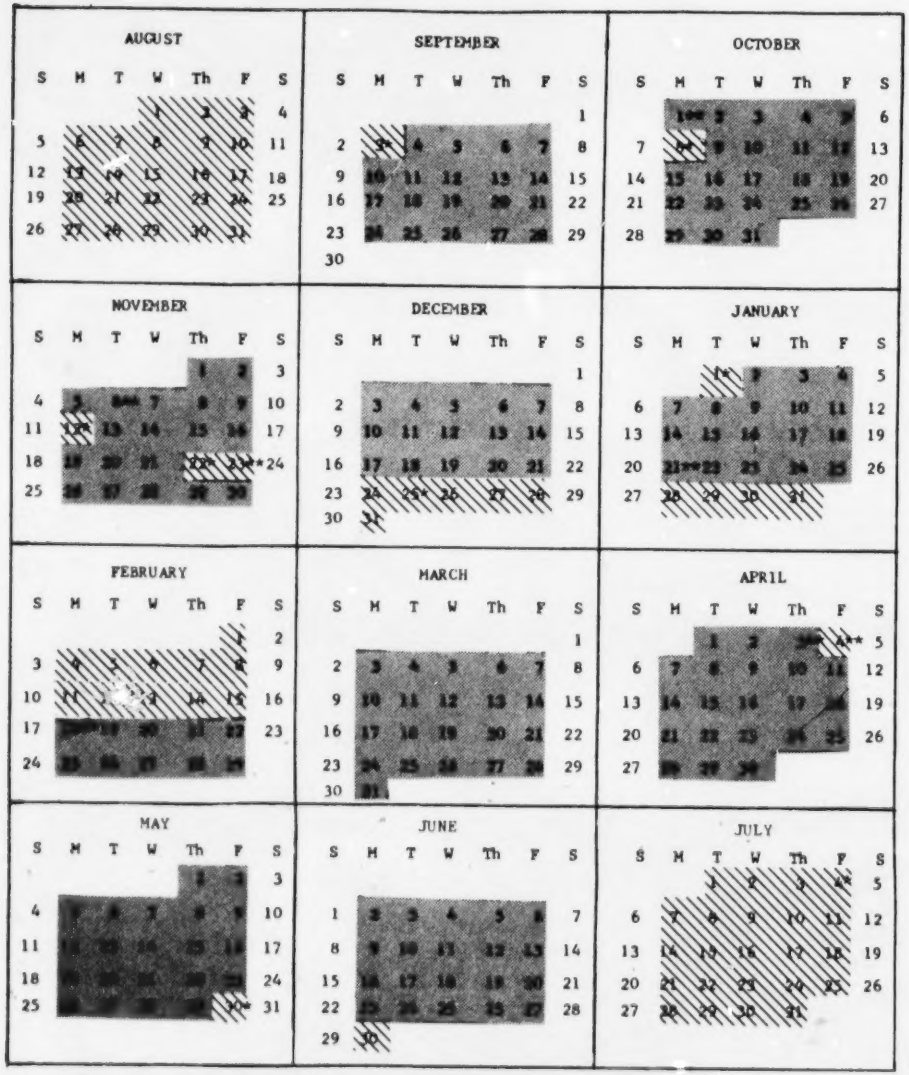
OPTION #1 - EXPERIMENTAL ALTERNATIVE SCHOOL YEAR CALENDAR
A CONVENTIONAL SCHOOL YEAR CALENDAR,
ONE WITH NORMAL WINTER AND SPRING VACATIONS



Special Characteristics:

The traditional school calendar is illustrated here. School begins the day after Labor Day (September 4, 1979) and ends in mid-June (June 20, 1980). All legal holidays, Christmas and Easter vacations, and a ten-week summer vacation are included in the calendar. There are four vacation days scattered in October and November plus a seven-day vacation during Christmas through New Year's Day. There are also six vacation days in February and one in May, plus a combined Easter-spring vacation of seven days. The 184 days of this calendar allow option of more vacation days if the four emergency closing days are not anticipated to be used.

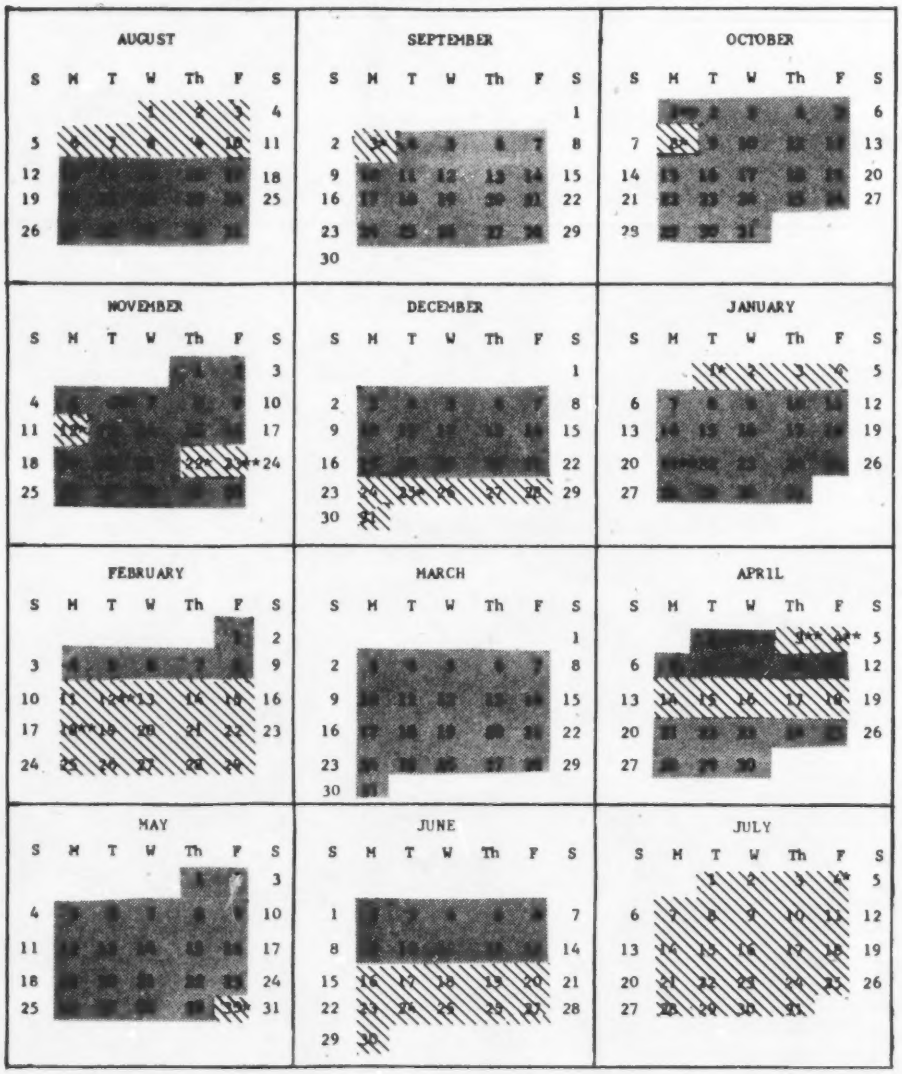
OPTION #2 - EXPERIMENTAL ALTERNATIVE SCHOOL CALENDAR
TEN-MONTH REGULAR SCHOOL YEAR WITH SPECIAL CLOSING AT MID-YEAR



Special Characteristics:

This calendar, though quite similar to the traditional calendar (Option #1), is designed to close schools during the colder part of the winter. School begins on the day after Labor Day (September 4, 1979) and operates through the end of June (June 27, 1980). All legal holidays, a seven-day Christmas vacation, a 15-day mid-winter vacation and a nine-week summer vacation are included. There are no Easter or spring vacations. The mid-winter vacation has balanced 93-day semesters surrounding it. The first semester has four vacation days throughout October and November, providing two three-day weekends and one four-day weekend. The second semester has two vacation days, one in April and one in May, providing two three-day weekends. The 186 days of this calendar allows for six emergency closings. Variations in this calendar may be provided by minor vacation shifts.

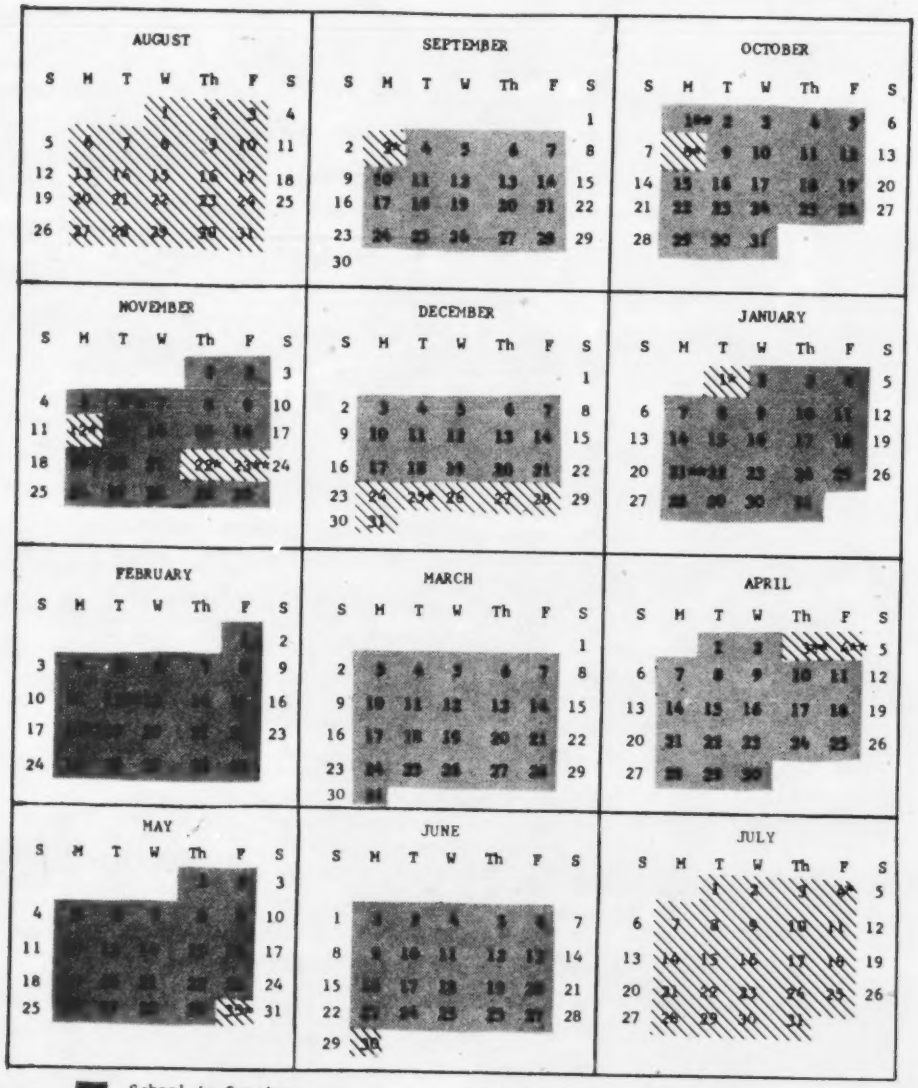
OPTION #3 - EXPERIMENTAL ALTERNATIVE SCHOOL YEAR CALENDAR
MID-AUGUST START, TWO-SEMESTER CALENDAR
WITH EQUAL DIVISION OF TERMS AT WINTER VACATION



Special Characteristics:

In order to provide approximately equal numbers of days before and after the Christmas vacation, school must be started earlier. Thus, this school calendar starts in mid-August (August 13, 1979) and ends in mid-June (June 13, 1980). All legal holidays, two special holidays, a ten-day Christmas vacation, a 15-day February vacation, and a five-day April vacation are included. There are 90 days of instruction before the Christmas vacation and 92 days in the second semester. This calendar of 182 days provides for only two emergency closing days. Some adjustments might have to be made in vacation days for those districts needing more emergency closing days.

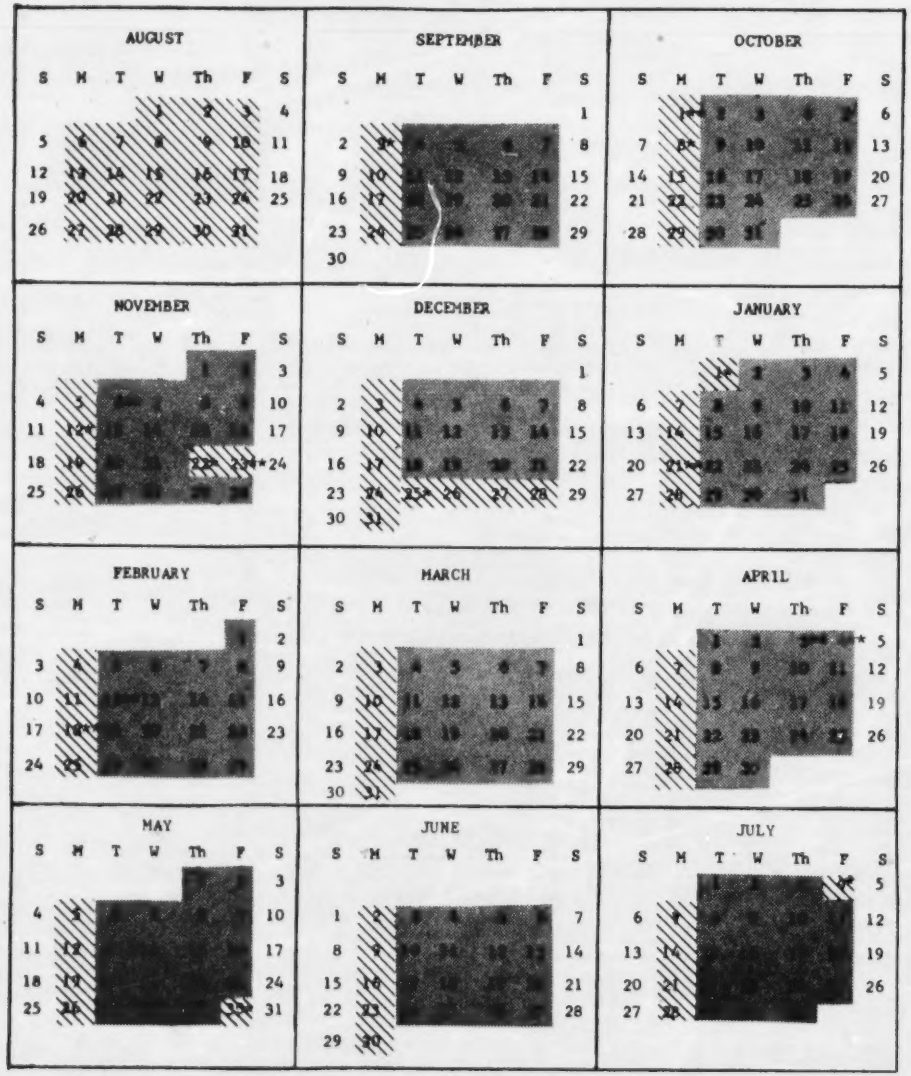
OPTION #4 - EXPERIMENTAL ALTERNATIVE SCHOOL YEAR CALENDAR
A TENTATIVELY SCHEDULED WINTER OR SPRING VACATION CALENDAR



Special Characteristics:

The unique aspect of this calendar is that it is designed to allow deferred vacations. Winter or spring vacations are tentatively scheduled for the year. The twenty extra days are to be first used, as needed, for emergency school closings, such as severe weather conditions, fuel shortages, and other contingencies. After chance of severe weather, or other emergency closings has passed, and the number of days above 180 days are known, winter or spring vacations may be scheduled. The calendar further provides for vacations on all legal holidays, two days each at Thanksgiving and Easter, and seven days at Christmas.

OPTION #5 - EXPERIMENTAL ALTERNATIVE SCHOOL YEAR CALENDAR
FOUR-DAY WEEK CALENDAR, WITHOUT TIME EQUALIZATION, WITH
A ONE-WEEK WINTER AND A FULL MONTH SUMMER VACATION

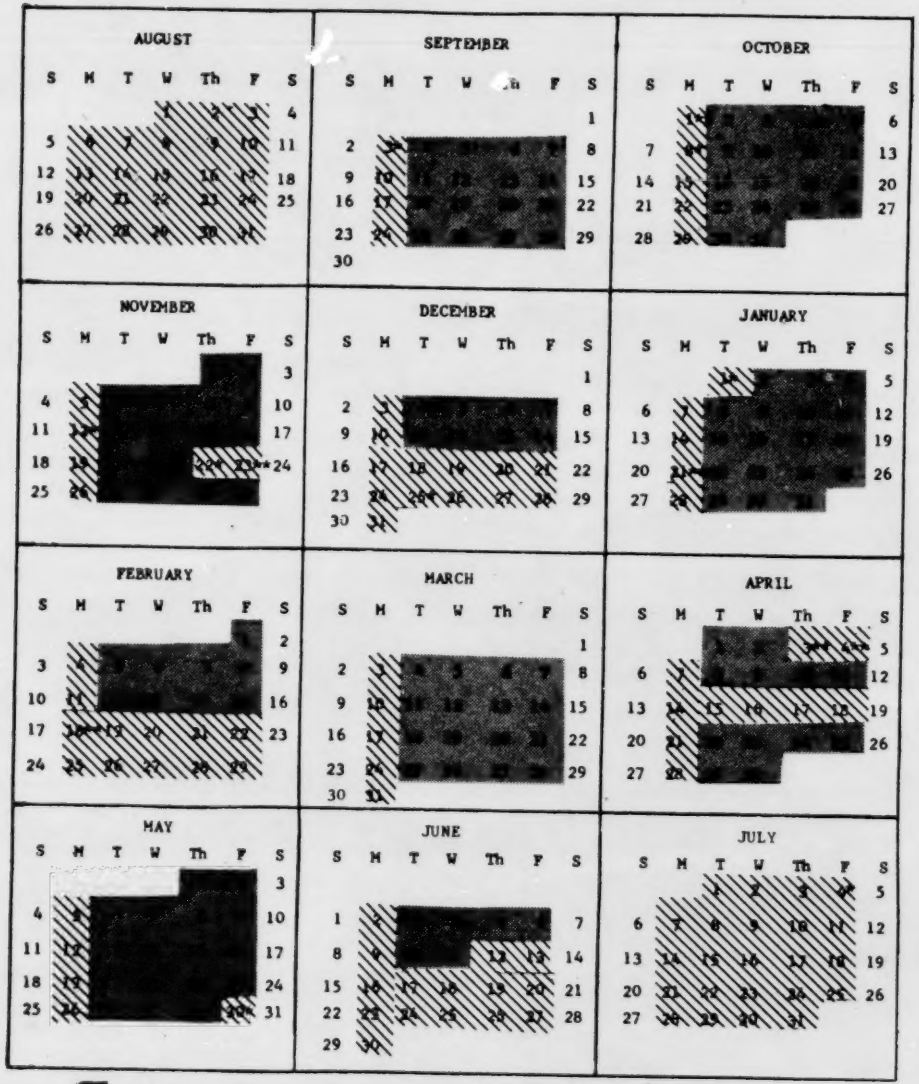


Special Characteristics:

In this kind of calendar, school is in session for four days a week for 5½ hours a day. There is a three-day weekend. Though this illustration shows Monday as the day off, Friday could be substituted to yield the three-day weekend. In order to meet the mandated 180 days of school at 5½ hours, the school year must run into the summer months. The calendar could be adjusted so that July rather than August would be the vacation month for some school districts.

In this illustration, school starts the day after Labor Day (September 4, 1979) and goes through July 31, 1980. All Mondays and holidays are either extended weekends or vacation days. A four-day vacation at Christmas and a month vacation period in August are included. The 183 instruction days provide for three emergency closings.

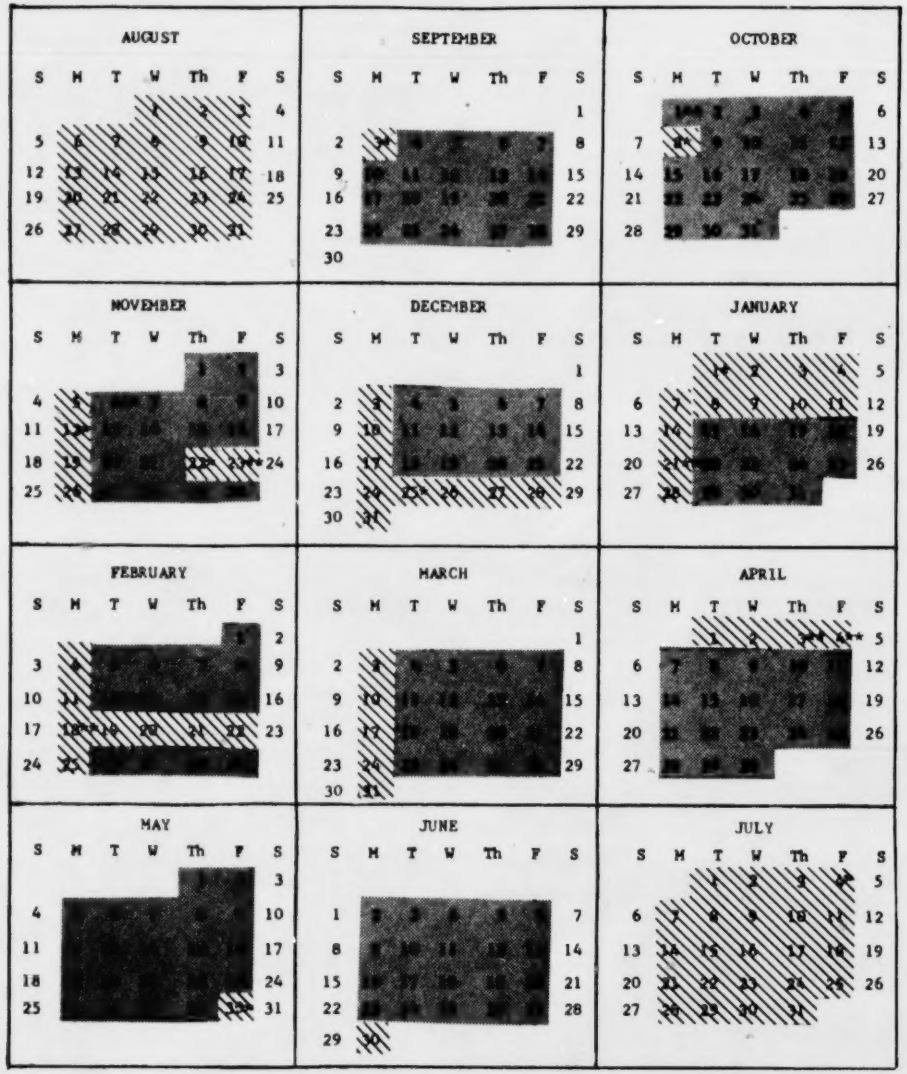
OPTION #6 - EXPERIMENTAL ALTERNATIVE SCHOOL YEAR CALENDAR
A FOUR-DAY WEEK CALENDAR WITH TIME EQUALIZATION FOR A SEVEN AND ONE-HALF HOUR DAY WITH TWO WINTER VACATIONS PLUS ONE SPRING VACATION



Special Characteristics:

This calendar is designed to give a four-day school week with a three-day weekend, and retain the summer vacation. The school day is lengthened to 7½ hours to yield approximately the same total number of instructional hours per year as contained in the traditional calendar. School begins on the day after Labor Day (September 4, 1979) and ends in mid-June (June 11, 1980). All Mondays, all legal holidays, six special holidays, plus two winter vacations, at Christmas and in February, and one spring vacation are included as non-attendance days. The 136 days of school at 7½ hours per day provide 1,020 hours, enough above the traditional 990 hours to allow for four emergency closing days. Friday closings could be substituted for Monday closings.

OPTION #7 - EXPERIMENTAL ALTERNATIVE SCHOOL YEAR CALENDAR
A FOUR TO FIVE-DAY WEEK WITH TIME EQUALIZATION FOR A SIX-HOUR DAY

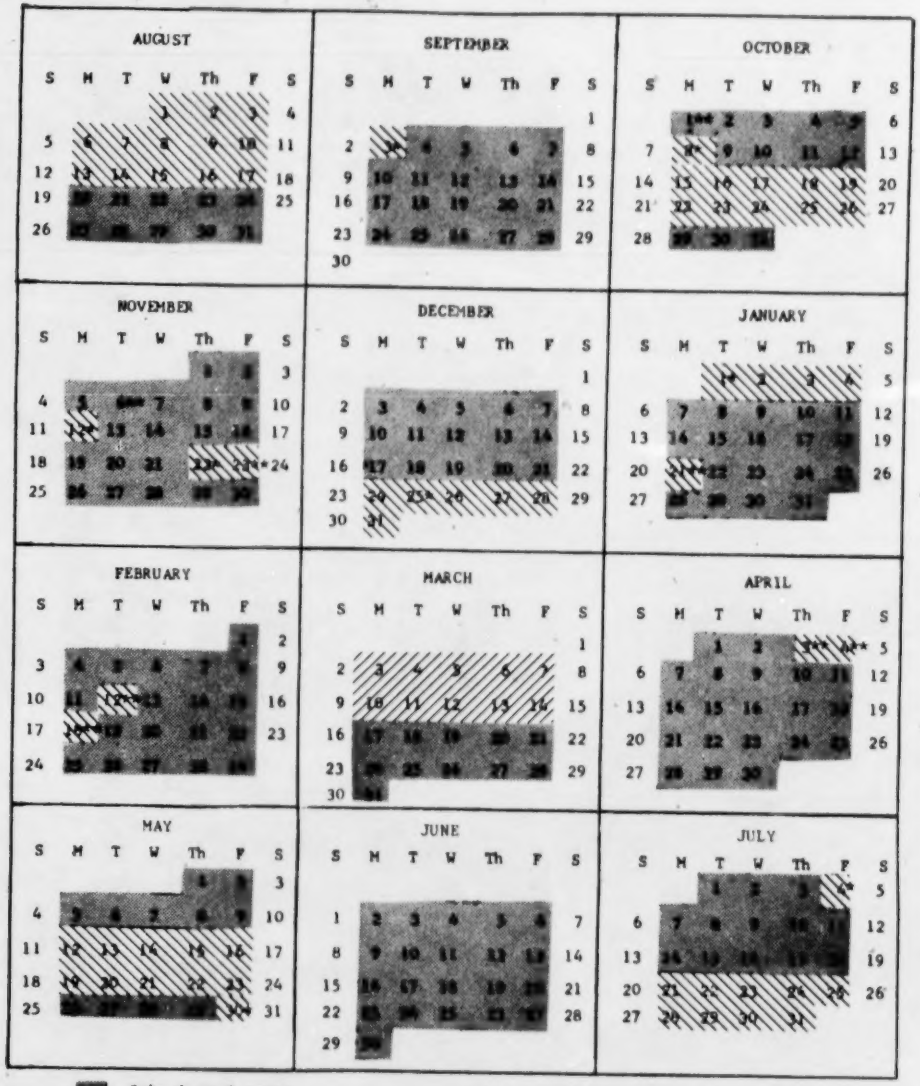


Special Characteristics:

This calendar is constructed to permit a longer weekend closing during the colder months, while maintaining the traditional five-day week during warmer months and also retaining the traditional summer vacation.

School begins on the day after Labor Day (September 4, 1979) and progresses to the end of June (June 27, 1980). School is in session five days a week throughout the months of September, October, April, May and June. During the months of November through March, there are no sessions on Mondays, although Friday closings could be substituted for Monday closings. In addition to the legal holidays, there are three extended vacations: 12 days at Christmas time, four days in February, and four days at Easter time. In order to preserve a full, two-month summer vacation, the school day has been lengthened to six hours throughout the year. This yields 1,008 instructional hours, allowing for the equivalent of three emergency closings.

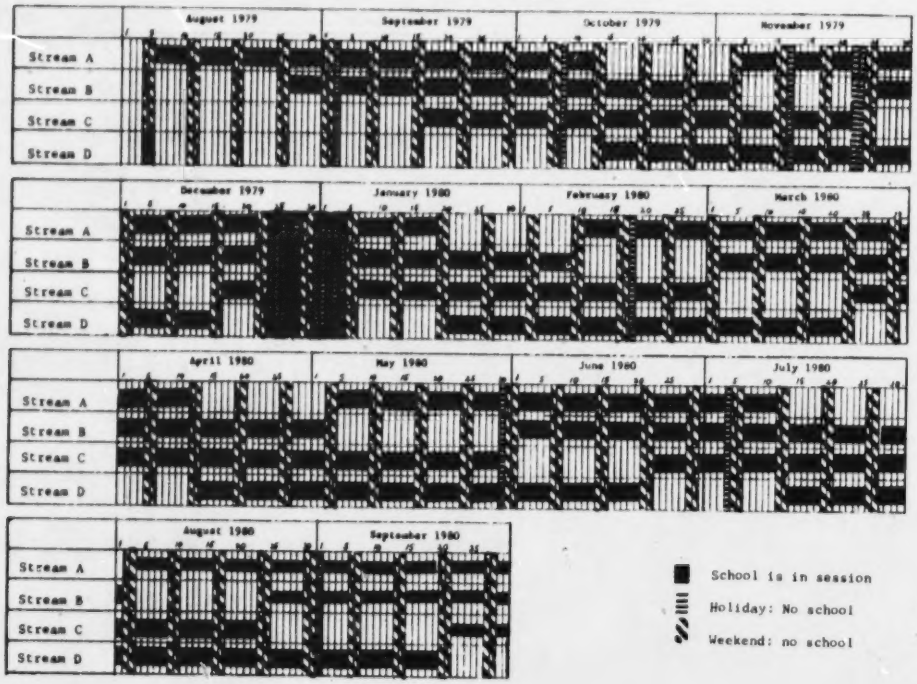
OPTION #8 - EXPERIMENTAL ALTERNATIVE SCHOOL YEAR CALENDAR
A CONTINUOUS LEARNING YEAR CALENDAR BUILT AROUND FIVE INSTRUCTION TIME PERIODS



Special Characteristics:

This calendar, beginning in mid-August and ending in mid-July, is designed to give five eight-week learning periods separated by two-week vacations. A mid-summer vacation of four weeks is provided. Variations in summer starting and closing times will permit different summer vacation periods. The 188 instructional days in this calendar allow for several emergency closings.

OPTION #9 - EXPERIMENTAL ALTERNATIVE SCHOOL YEAR CALENDAR
FOUR STREAM, TERM ROTATION, ALL YEAR, BASED ON 45-15



Special Characteristics:

This calendar is like many possible arrangements, which divide the students into groups of about the same size having some groups in school while others are on vacation. Children are placed into groups by neighborhood. Thus, children from the same family are in the same group. In this calendar there are four groups. Three groups are in school while one is on vacation. Each group starts an "in school" term three or four weeks after the one before it. The cycle of nine weeks in school and three weeks on vacation continues throughout the year. School is closed on all legal holidays and for a 10-day Christmas vacation. There are 182 to 184 days of school allowing two to four emergency closing days. Minor changes in the calendar can be made to fit local conditions.